

## "HANDS-ON" SCIENCE

### THE DANCING PENNY AND THE LIVE BALLOON

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Grade 5

#### Background Information:

Molecules of a substance move more rapidly as the substance is heated. This is true of air. As air becomes warmer, its molecules move more rapidly and require more space for their motions. Therefore the heated air expands.

#### Materials:

1. a plastic container for hot water
2. a bottle with a narrow neck (pop bottle)
3. a penny
4. a small balloon (one that has been inflated before)

#### Procedure:

1. Moisten the opening of the bottle and place the penny flat on the bottle mouth.
2. Fill the plastic container with hot water.
3. Immerse the bottle, which is covered with the penny, in the water and observe the dancing coin.
4. Answer questions 1-4 below in complete sentences.
5. Remove the penny and now place the small balloon over the mouth of the 'empty' bottle. Let it hang limp against the side of the bottle.
6. Empty the water in the plastic container and again fill it with hot water.
7. Immerse the bottle with the balloon on it in the hot water.
8. Answer questions 5-8 below in complete sentences.

#### Questions:

1. What was in the bottle before covering it with the coin?
2. What was the moisture on the bottle opening necessary for?
3. Why did the penny go up and down (vibrate)?
4. Would the penny also vibrate without moisture on the opening of the bottle?
5. What is in the bottle now?
6. Why did the balloon inflate itself?
7. How can the balloon be deflated without taking it off the bottle?
8. What does air do when it is heated?